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RESEARCH

Spatial Reading: Digital Literary Maps of the Icelandic Outlaw Sagas

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Digital humanities scholarship contributes to current conversations on literature in many forms, especially in its recontextualizing of what it means to read. By integrating visual, spatial, and quantitative forms of knowledge alongside the practice of text-based hermeneutics, digital techniques expand the possibilities of interpreting texts, particularly with the emergence of widely available geospatial and data visualization tools. This article outlines and reflects on a methodology for producing geospatial and data visualizations of place names in the Icelandic outlaw sagas, and discusses how the results corroborate existing research and also facilitate critical methods of 'reading' these texts spatially. While articulating the saga-specific findings of the visualizations, this article also contextualizes the conceptual work of digital literary mapping as a method that is particularly insightful as we determine the role and validity of digital techniques, especially for interdisciplinary and historically-situated work.

Keywords: Mapping; data visualization; Icelandic sagas; digital humanities; literature

Introduction

The *Íslendingasögur*, or *Icelandic Sagas*, were recorded in manuscript form from the late twelfth century to the early fourteenth century, and are thought to contain a mixture of oral tradition and literary styling. Jesse Byock (1984) characterizes them as "plausible" vernacular tales that detail the settlement period from approximately 980 to 1030 and show the development of an indigenous Icelandic approach to literary narrative (153). As a result of this intermingling of oral, literary, and historical forms of writing, one of the most distinctive qualities of the *Íslendingasögur* is the prevalence of place names in the narratives. As Eleanor Rosamund Barraclough

(2010) has argued specifically regarding the outlaw-themed sagas, descriptions of geography in *Grettis Saga* “not only shape the plot but also contribute towards the complexity of the narrative layers” as a result of medieval Icelandic outlawry’s close connection to the landscape (365). In the field of Old Icelandic scholarship, Byock (1984) and Barraclough’s (2010) work suggests that thinking geographically about sagas—despite their sometimes supernatural or fictive elements—is not only appropriate but indeed essential to understanding their meaning in historical context.

Indeed, the *Íslendingasögur* present a unique intersection of the literary, the geographic, and the historical. Given place names’ relatively unchanged status since the settlement, as well as modern Iceland’s deeply ingrained knowledge of the sagas, many of these place names remain readily traceable today (Hastrup 1985, 59). Combined with Byock’s (1984) attention to the historical information of the sagas—which constitute interpretive representations, rather than “history as it happened” (Clover 1986, 100)—we cannot consider place names in Icelandic sagas as *just* an act of geographic representation, or as *just* literary devices, but rather indicators of a complex web of meaning across categories of history, literature, and landscape.

To vivify this geographic element in *Grettis Saga*, Barraclough (2010) uses a traditional humanistic method, framing “close textual analysis in terms of a saga’s topographical references” (386). However, as David Joseph Wisley (2017) has described, the profusion of affordable and accessible digital mapping tools in recent decades offers scholars new methods with which to interrogate geographic elements in literary texts (S147). Given the interdisciplinary bent of Icelandic studies, where anthropologists, sociologists, environmental scientists, folklorists, and others often congregate around the *Íslendingasögur* as a critical artefact, mapping projects occur in relation to this body of literature to great effect (Byock 1984, 168). On the interdisciplinary side, the Human Ecodynamics Research Center has undertaken extensive, up-close work on saga-steads, including mapping projects to geospatially define these sites (<http://herc.gc.cuny.edu/>). Furthermore, Emily Lethbridge’s (2018) ongoing work on environmental readings of the sagas and their geography is indispensable, including the development of the “Icelandic Saga Map,” that as of

2017 is in beta online and has, with a team of five geocoders and programmers, mapped the locations in all of the *Íslendingasögur* (<http://sagamap.hi.is/5-people>).¹

Digital literary maps in particular, or maps that produce spatial data from texts that are considered imaginative or creative as opposed to charters or historical records, offer new critical possibilities for visualizing and understanding the interaction between spatial and geographic knowledge in literary texts. As Wrisley (2018) notes of his digital project, *Visualizing Medieval Places*, examining “where, when, and how often locations are mentioned in a literary-historical corpus” affords new means of depicting place names, particularly with the rise of more widely-available geographic information systems (GIS) technologies (S145, S147). Like the Icelandic Saga Map, the *Visualizing Medieval Places* (2018) project incorporates multiple texts—in the case of the latter, one hundred and fifty medieval French texts as of early 2017—across large corpora, which enable researchers to visualize patterns across texts, genres and eras.

Many digital maps contain rich metadata, beyond identification of place names alongside their geospatial points. While additional geographic or topographic information is a traditional feature of geospatial maps, digital platforms increasingly allow for multimedia, geocoded elements. This type of mapping has been conceptually described as “thick mapping,” after *Hypercities* (2014), that both theorizes (as a book) and performs (as an interactive website) how geospatial mapping is engaged in a turn towards “multimedia and multilayered” digital platforms (Bodenhamer 2013, 11). While “thick mapping” discusses multimodal qualities of maps on digital platforms, we might more capaciously consider the rhetorical function of visualization as a mode of “distant reading,” a term coined by Franco Moretti (2005) to describe a style of literary analysis in which “the reality of the text undergoes a process of deliberate reduction and abstraction” in order to examine a higher volume of texts and possible patterns that exist across them (1). Now, distant reading generally occurs on a large (if not massive) scale, incorporating over a hundred texts at a time,

¹ I completed the work for this project between 2013–2015, around the same time that Dr. Lethbridge began the development of digital mapping based on her own research and fieldwork. I thank both Dr. Lethbridge and the scholars of the Human Ecodynamics Research Center for their feedback in earlier stages of this project.

to analyze patterns across large corpora (Underwood 2016) and to this end requires automated computational procedures that are ultimately represented as numerical or visual output (Drucker 2017, 629). And, after Willard McCarty's (2004) discussion of computational modelling, we might understand the resulting visualizations as "*temporary states in a process of coming to know* rather than fixed structures of knowledge." By considering geospatial mapping as a form of "distant reading" in its large-scale iterations, we might consider the question of mapping not just as a vehicle for spatial knowledge, but as a particular mode of *reading* literary works.

The question of scale is essential in digital maps, encompassing not only the geographic range depicted, but also the question of project scope. The premise of "distant reading" by definition requires a corpus that exceeds the capacities of traditional reading and instead requires computational study; as Alison Booth (2017) has noted, the question of scale is fundamental to the definition of distant reading itself (621). So, while projects like Visualizing Medieval Places, with its large-scale dataset, often require many team members, institutional partners, computational know-how and digital labor, their scale also suggests how we might read their results. The debate in a recent *PMLA* (2017), featuring eleven scholars, including Moretti (2005), on the topic of distant reading, illustrates the extent to which large-scale, automatic modes of text analysis and other computational approaches have been internalized as possible methods for analyzing humanities data. While Booth (2017) uses "mid-range reading" to describe her work with the *Collective Biographies of Women*, a digital project that incorporates XML markup, network visualization, and other digital elements, it remains difficult to consolidate the efforts and findings of what we might call small-scale digital projects, in which 'scale' refers not only to a limited geography, but also to smaller datasets, staffing requirements, and even preservation considerations.

Perhaps because of the potential for technical limitations in project execution, variable maintenance strategies for project longevity, and the overall trend towards ephemerality in small-scale mapping projects, the excitements and failures of these projects are often underrepresented in critical conversations on how to engage digital mapping to make meaning of literary texts. However, it is precisely because

of their shorter time frames, smaller staff, and more localized datasets, that these types of projects—perhaps taken on as a first foray into digital humanities, or into a different disciplinary field—stand to offer a valuable perspective on experimental methods.

While a smaller project may not necessarily embody the scope or level of automation necessary to count as distant reading, we may examine this type of work under the umbrella of “surface reading,” after Stephen Best and Sharon Marcus’s (2009) formulation that characterizes reading not as an uncovering of metaphorical or symbolic meaning (generally obtained by close-reading as a technique), but rather as an act of collating what might be on the surface—whether linguistic elements, a text’s materiality, or patterns of literal meaning. By engaging surface reading as distant reading’s scaleable, perhaps more attentive cousin, we might apply this methodology to smaller-scale and smaller-scope mapping projects to render their critical accomplishments more visible.

To examine the possibilities of greater engagement with small-scale and experimental digital maps, this article will use the digital literary mapping project *Space and Place in the Icelandic Outlaw Sagas* (Kinniburgh 2014), a geospatial and data visualization mapping project that depicts all place name locations in the Icelandic outlaw sagas according to their geospatial information and also their narrative function (<http://www.columbia.edu/~mck2158/main/>). I will contextualize the methodologies I used in this project to generate geospatial and network visualizations of place names in the Icelandic outlaw sagas, and examine these visualizations alongside more traditional modes of saga analysis by scholars including Barraclough, Byock, and Kirsten Hastrup while situating my methods alongside other digital literary mapping work. This project, while it contributes to the field of saga studies, is most concerned with the question of mapping methodology. Its contribution is a thinking-through of the question of mapping, rather than a geolocating tool like the National Land Survey of Iceland, or an opportunity to distant-read across a large and comprehensive corpus, such as Lethbridge’s *Icelandic Saga Map* (2018). While the project that I will describe has been rigorously researched in regard to its geospatial locations, it nevertheless upholds Bethany Nowwiskie’s (2010) provocation

that “geographic specificity may prove less important than interpretive possibility” when producing or examining experimental maps that depict literary materials (2).

To this interpretive end, I detail the technical and interpretative steps of this project at each turn after Johanna Drucker’s (2011) call for a humanistic approach to data display, that makes visible the “framework on which the statistical data were constructed” instead of relying on visualization as an objective, presumably empirical display of neutral data (8). This type of approach necessarily calls for traditional techniques—such as close-reading—alongside digital methods, and raises the question of whether digital techniques necessarily produce novel results—especially results that seem to confirm what we already know. However, the outcomes of digital work—particularly mapping, whose relationship with objectivity and fixity is of special interest to humanities scholars—often transcend mere confirmation of traditional methods, by virtue of their methodological choice to *read*—and thus imagine—textual information in a fundamentally different mode. In what follows, I outline my methodology and the questions it raised for both geospatial and network visualization in order to consider how we might conceive of digital mapping procedures alongside questions of rigor and compromise, as well as how traditional inquiry and digital methods can complement each other in this field. In this capacity, I discuss my project as a case study that suggests how we might more fully engage what it means to ‘read’ a text’s spatial data visually instead of narratively, and to explore possibilities for more fully rendering the interpretive acts in visualization both transparent and meaningful.

Geographic Place: Mapping Methods

We might consider the process of geospatial mapping as initially a conceptual exercise in data selection—how do certain texts invite geospatial inquiry, and others seem to resist it? In the context of the Icelandic sagas, a vast corpus of literature that spans the medieval era of the island, the outlaw sagas offer particularly engaged grounds for geospatial mapping due to the deep relationship between social life and the environment in the context of Icelandic history. Outlawry achieves its social and legal definition in medieval Iceland as a result of the *Grágás*, or law codes of early Iceland, but is ultimately largely defined by the difficult environmental conditions

of the island. Barraclough's (2010) formative research on landscape and narrative in two outlaw sagas, *Grettir's Saga* and *Gisli's Saga*, hypothesizes that outlaw sagas in particular show considerable investment in geographic spaces because of their genre, and that place names are essential to the narrative arc of these works. The question of narrative technique in the Icelandic sagas has received ongoing critical attention given that the sagas are not quite chronicles, romances, or any other widely-recognized contemporaneous form, renowned in particular for their paratactic and prosimetric style (Byock 1984, 154). The prevalence of place names within this unique narrative structure suggests that a solely narrative or geographic assessment of these elements would ultimately fail to reveal how they operate in their literary or potentially historical context, necessitating research with a dual approach and multiple visualizations.

In order to examine Barraclough's (2010) thesis statistically, I generated a digital corpus of three outlaw sagas as designated by Örnólfur Thorsson's categorization, each of which is featured in the most authoritative English language edition, *The Complete Sagas of Icelanders, Including 49 Tales*, edited by Viðar Hreinsson (1997, xxi). This edition includes *The Saga of Grettir the Strong*, *Gisli Sursson's Saga*, and *The Saga of Hord and the People of Holm*; for the purposes of this project, these texts are denoted as *Grettir's Saga*, *Gisli's Saga*, and *The Saga of Hord and the People of Holm*. The decision to use all three Icelandic outlaw sagas together stems from Best and Marcus' (2009) surface reading, which "aggregates...what is manifest in multiple texts" as "semantically continuous with an individual text's presented meaning" (11). Considering the interconnected geographic and narrative tropes in these sagas, reading these three texts as a unit allows us to skim the surface, engaging broader patterns in the literature with digital data visualization, expanding outward possibilities for interpretation.

The decision to work in translation was unorthodox and not taken lightly, but facilitated the execution of the project with the time and labor constraints. Hreinsson's *The Complete Sagas of Icelanders, Including 49 Tales*, is a powerhouse of translation, which featured strict editorial guidelines and standardized place names in their modern Icelandic (Hreinsson xviii). For specific translations of the outlaw sagas, Bernard Scudder and Martin Regal use the authoritative *Íslendingasögur* as

their base text, and Robert Kellogg uses Örnólfur Thorsson's 1995 edition. By working in translation, this project was able to use standardized Anglicized versions of the Old Icelandic place names which made search and display more consistent across the various web-based and digital platforms used to digitize and display the data. Thus, spellings of place name in the project are standardized and Anglicized according to these editions, which ensures unity and searchability across the dataset. Open-source, Old Icelandic versions of the text were consulted for accuracy to double-check place names that appeared Anglicized in translations, which ensured correct etymology.

By working in translation, this project continues, in a way, the work of Hreinsson's edition in making the Icelandic sagas more available to Western scholarship more generally, particularly given the important role Icelandic sagas play in medieval literary studies and their close connection to Old English writing and Anglo-Saxon culture. The trade-off of working in translation for accessibility and in light of the project timeline does come at the expense of the nuance of the original language. However, given this project's negotiation of the boundaries between close and surface reading by reading broadly across the patterns of place name presence and types of usage in the selected sagas, the nature of these particular geography-specific words and patterns likely have little ambiguity of meaning in the original text.

Of course, standardization and translation are significant interpretive acts, and the project's methodology and findings acknowledge this fully. Place names in the medieval North Atlantic, as today, are richly symbolic, subject to change based on inhabitants, likely nicknamed at times, and otherwise constitute complex lenses to linguistic, historical, and cultural worlds (Niles 2014). The choice to standardize and translate does detract, in some ways, from our ability to analyze a place name's evocative qualities. Yet, as Drucker (2011) notes, the transformation of literary materials into data inevitably results in loss of fidelity and complexity—but this should not preclude experiments to understand what possibilities visualization may well produce. I hope others will be able to build where I leave off in the close particulars of the Old Icelandic, just as I have built on the foundations of Old Icelandic philology and onomastic studies in digital context.

The first half of this project consisted of extracting place names from the texts of *Grettir's Saga*, *Gisli's Saga*, and *The Saga of Hord and The People of Holm* and mapping this data on a geospatial grid (see **Figure 1**). The question of what type of geospatial grid deserves further elucidation, since this project maps place names onto a contemporary, rather than medieval, map of Iceland. While Iceland did not become an independent republic until 1944, its isolation as an island, lack of significant immigration except for its initial settlement in the ninth century by Viking immigrants, and status as an impoverished country due to famine and plague in the early modern period meant that Icelanders had little outside influence, linguistically or otherwise on their culture, and the political borders of the island remained unchanged (Nordal and Kristinsson 1975, xiv). Since foreign words are rarely adapted in Icelandic due to the language's linguistic and morphological structures, the Old Icelandic language of the sagas and modern Icelandic are remarkably similar (Karlsson 2000, 363). As such, place names can be readily traced to their medieval antecedents with resources such as the Árni Magnússon Institute for Icelandic Studies' Place Name Institute, whose database of place names was recently made public, and the National Land Survey's

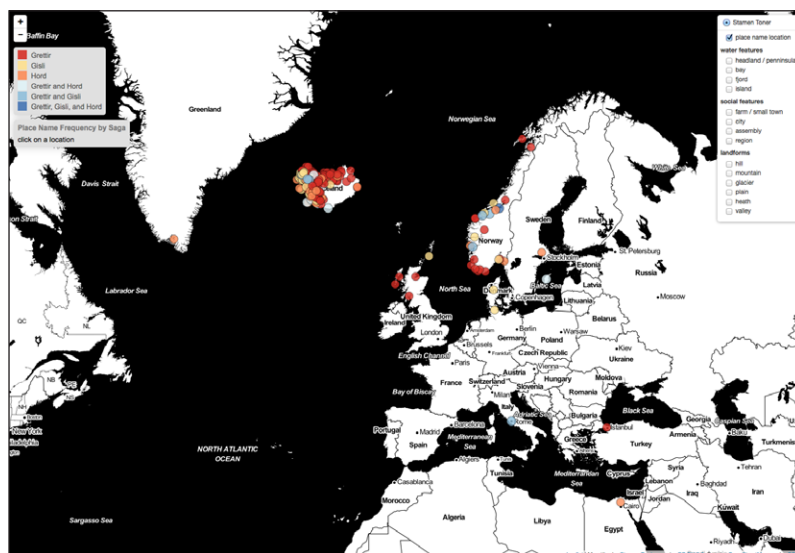


Figure 1: This illustration shows the interactive geospatial map, produced using the Javascript library Leaflet. The map is available at <http://www.columbia.edu/~mck2158/place/>.

Place Name Tool whose maps confirmed the geographic coordinates of saga place names. Thus, the combination of linguistic similarity and available digital resources affords accurate localization even for medieval place names, demonstrating a certain continuity across medieval and modern geographies.

While many strides have been made in automatic geolocating and location extraction (Al-Olimat, et al. 2017), as well as natural language processing to identify entities like place names with impressive granularity, this project relies on a traditional humanities methodology for extracting place names and then mapping them geospatially: careful, attentive reading by a human. Using a labor-intensive model of close-reading, hand encoding, and iterative geocoding, this practice returns to the principle of surface rather than distant reading, since automation was not used for data extraction. Booth (2017) describes a similar methodology for her *Collective Biographies of Women* as “slow” reading, in which an editorial team selected from controlled vocabularies for XML markup (621). For this project, both slow and close are apt: the XML dataset contains approximately 117,000 words. However, this type of mixed-methods digitization constitutes a useful protocol for combining traditional humanities methods of close-reading for context and information with the possibilities afforded by extracting an interpretive dataset from a literary text. Øyvind Eide (2016) echoes the importance of balancing traditional and computational methods in his own TEI encoding, deeming a “human reader” necessary for a full understanding of the textual material (56). After Drucker’s persistent call for greater transparency in the interpretive act of data production from humanities sources, in what follows I will enumerate, in detail, the process of transforming the outlaw sagas into a mappable dataset, as well as the opportunities and challenges therein.

As a guiding principle, this project privileged open-source platforms for extracting and depicting data. Open source, as consolidated by the Open Source Definition (Version 1.9), refers to a type of software that can be shared freely with its source code, and whose redistributions or adaptations must also be distributed freely and with source code accompanying. Open-source platforms contrast proprietary software platforms, which must be purchased by license, have limits on redistribution, and often do not make their source code available. The choice to use open-source

systems in this project stems from the need for replicability: theoretically, any user could freely download all programs used to create the maps and visualizations of this project, and recreate the results. To that end, the main platforms in this project used for data processing—XML, TEI, QGIS, and the JavaScript libraries Leaflet and Gephi—are all available under open-source licenses and any user can experiment with the platforms and methods enumerated below.

After identifying appropriate versions of texts, the project itself began with a full scan and digitization of the source texts with the software ABBYY FineReader 11.0, which uses optical character recognition to produce a digital text. Once scanned, the files were converted to eXtensible Markup Language (XML), which uses a system of tags like HTML to identify specific textual elements. The Text Encoding Initiative (TEI 2014) provides the overarching system by which users can format files in XML and mark them up for specific textual elements; Eide (2016) identifies the development and implementation of TEI in 1985 as a “turning point” in the digital humanities, for the possibilities of textual modelling, and it is often used as an open-source methodology for encoding texts for later digital manipulation (3). With TEI, users can use templates or develop custom schemas to tag textual elements—such as `<placeName>`, in ways that take advantage of the ‘extensible’ aspect of XML’s format. Using a custom schema for place name elements, including geographic features (such as fjords), I close-read and hand-encoded all instances of place names. This close-reading style enabled me to capture data that did indicate geographic location, but was not mentioned as a place name proper—such as “Bjarg’s farm.” Furthermore, the practice of close-reading for an initial markup enabled me to tag not only instances of place names and geographic metadata, but also interpretive categories about how each place name functioned in narrative context—the latter of which is fully enumerated in the second part of this article. For instance, the above example, “Bjarg’s farm,” represented a construction that occurred with enough frequency to warrant tagging as “possessive,” a term I used as a shorthand to indicate words that referred to a geographic site but were framed according to a saga character. This process became the basis of the second part of this project—the networked data visualizations, which I will discuss in the second section of this article.

A primary benefit of XML, other than its flexibility of encoding, is that it can easily be converted to a comma separated value (CSV) file—a tabular format ideal for storing and manipulating data, and widely accepted as an input format for geospatial and data visualization software. I cleaned the data to eliminate column redundancies and extraneous blank spaces, and to focus on the following variables: place name, chapter and saga of place name, type of geographic feature (where possible to identify or mentioned in the text), as well as whether the place name was approximate or not fully confirmed. On the literary side, this dataset also contained type of place name usage (such as possessive, as mentioned above), and whether the place name appeared in poetry, prose, or speech. This data set was then used as base reference to manually tag locations in the open-source software QGIS, known as Quantum GIS at the time of this project (2012). The process of finding places named in the sagas was iterative and intensive, involving a methodology of cross-referencing Google Earth, search engine queries, and the National Land Survey of Iceland's place name tool, recommended by Hallgrímur J. Ámundason at the Onomastics Department at the Árni Magnússon Institute in Reykjavík, Iceland. During this process, I also continued to standardize place names where discrepancies existed, using the spelling of the name that most frequently returned the best results in search engines and the National Land Survey of Iceland's place name tool. Based on a unique ID, geocoded place names were then linked with the above metadata categories, including also the number of times a place name is mentioned within each saga. The resulting shapefiles from this geocoding were then mounted in an interactive browser using the JavaScript library Leaflet (Agafonkin 2014), where users can click, scroll, and zoom through the map and its corresponding metadata.²

² While the project can still be digitally accessed (<http://www.columbia.edu/~mck2158/main/>), future work must be done to ensure the accessibility of the map. For this reason, my data is available to other researchers upon request where copyright permits, and this article serves as a thorough documentation of my methodology. Project management and sustainability constitute an important and ongoing conversation in digital humanities; Ashley Reed (2014) has discussed questions of project management and sustainability models for large, longer-term projects, and Bethany Nowviskie and Dot Porter's "Graceful Degradation Survey" (2010) attempts to survey the field for project types and sustainability.

On the map itself, each geospatial point is colour-coded to show in which of the sagas the place name appears. Hovering over or clicking on a place reveals further metadata about how many times the place name occurs in its respective sagas. The map contains 346 out of the 427 unique place names extracted: an 81% rate of completion that could certainly be improved with further research and fieldwork. Obstacles to a higher rate of completion include name changes, particularly when place names also designate certain activities such as legal assembly—a common feature in medieval Icelandic literature. Across the outlaw sagas, Althing or the Thing appears fifty-four times, although the place name that it in fact relates to is Thingvellir. Since Thingvellir remains a popular tourist spot in Iceland today because of its well-documented history in Icelandic law-making, mapping this place posed little challenge. However, for more obscure names that could not be found on the modern geographic grid using the resources of the Árni Magnússon Institute and the National Land Survey, it is likely that a shift between medieval and modern usage may have occurred, and the workflow for location extraction and georeferencing was unable to capture this level of granularity.³

The mapped data, however, supports many of the interdisciplinary arguments that scholars have made in their various assessments of medieval Icelandic culture. Notably, points tend toward the peripheries and fjords of the island, mirroring the Icelandic pattern of settlement along the coast (see **Figure 2**). The reason for this is environmental: Iceland's high percentage of glaciers covering land mass means that a large percentage of the island is uninhabitable, which resulted in most of the narrow swathes of territory near fjords and the coast becoming rapidly populated in the settlement period (Thorsteinsson, Olafsson and Van Dyne 1971, 87). In contrast to these coastal points, those that tend toward glaciers and the center of the island can be explained by the literary genre of the selected sagas. Outlaws hid in tundras, glaciers, and islands, and generally spaces in the center of the island that

³ There is an entire field of studies for Old Icelandic onomastics that I am unable to fully address here, but whose work undergirds many of the important resources such as the National Land Survey and the Árni Magnússon Institute for Icelandic Studies' Department of Place Names.

were unfit for habitation and therefore socially desolate. Grettir, for instance, has been described as a “pioneer of the interior,” and many of the points featured in his saga (coded red) trend towards spaces that remain unsettled today (Barraclough 2010, 370). Considering the environmental history, settlement patterns, and ideas of community as expressed in the outlaw sagas, the map’s tendency towards both the coastal and occasional inland points visualizes and supports the claims of existing research, undergirding historical interpretations of saga literature.

One of the primary questions this digital map makes evident is the relationship between geographic scale and regionality. The prevalence of place names on the island’s western and northern coasts is also immediately visible when mapped. According to the *Landnámabók*, which details the settlement of Iceland between the ninth and tenth centuries, the earliest settlers claimed tracts of coast that extended inland to valleys first since these were the most valuable sources of natural resources (Smith 1995, 320). These coastal and fjord-centered points also reflect the localized setting of the outlaw sagas, especially given that each saga begins with genealogical reference to the early settlement period. *Grettir’s Saga* has a main locus around

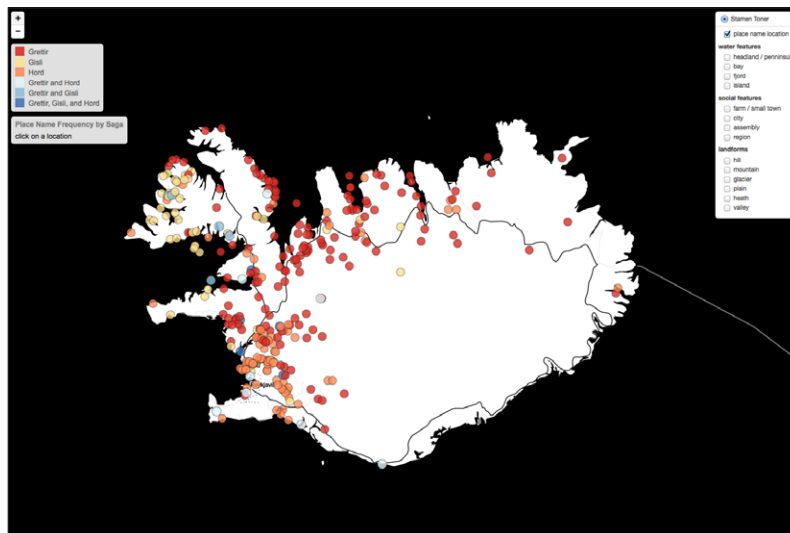


Figure 2: Geospatial points tend towards the coastlines, with interior spaces that suggest the outlaw themes of the sagas’ genres. Grettir’s points show particular emphasis on interior and island spaces in Iceland, and are coded in red.

Hunafloi and Skagafjord on the northern coast of the island; *The Saga of Hord and the People of Holm* occurs around Hvalfjord and Borgarnes in the middle of the western coast, and *Gisli's Saga* focuses on Onundarfjord, Dyrafjord, and Arnarfjord in the northwestern fjords. In the map, the connection between the settlement patterns indicated in *Landnámabók* and environmental research that indicates rich resources in these areas becomes readily visible as a link between environmental and literary history.

While these places do indeed cluster locally according to the setting of their respective saga, overall they have surprising variety and geographic reach. Given the outlaw theme of the sagas, that pivot on social and geographic banishment, place names reflect the outlaw wanderings of their main characters as they stray from their local communities. Particularly in *Grettir's Saga*, the prevalence of red points across the map suggests that even as the text claims to tell the story of Grettir from Bjarg, the overarching purpose of the saga is to depict a local history and also sketch the contours of Iceland itself—as well as the Norwegian coast from which the Icelandic settlers came, and points as far-ranging as Constantinople and the Firths (Scudder 1997, 64). While Grettir's higher overall number of place names may be attributed in part to the text's longer length, the other sagas also reflect this pattern of wide-ranging locations. *The Saga of Hord and The People of Holm* includes Gardar, or modern day Igaliku in Greenland, the Nile River, and Uppsala, while *Gisli's Saga* features Hedeby, Viborg, and Rome. The scope of the sagas across Western Europe and the North Atlantic suggests that while the texts discuss the stories of local characters, their frameworks are in fact epic.

The range of points may be attributed to the Viking heritage of Icelandic settlers, who were seafarers in the medieval North Atlantic before populating the island. This historical observation is corroborated by the prevalence of shared place names in fjords and bodies of water, including Breidafjord in *Grettir's Saga* and *Gisli's Saga*, the river Thjorsa in *Grettir's Saga* and *The Saga of Hord and the People of Holm*, and Borgarfjord which is featured in all three sagas. The prevalence of these points reinforces the seafaring nature of travel in the sagas, which Barraclough (2012) suggests is integral to geographic ideas of space as well as narrative thrust in saga

literature (2). Thus, even as these mapped points reveal close local interest, they also suggest that Icelanders covered great distances in the sagas, framing local histories within an impressive context. In their use of place names, the outlaw sagas use narrative to spatially map the coastal shapes of the medieval North Atlantic and beyond, a feat that can be seen instantly and clearly when mapped on a geospatial grid.

A common critique of digital mapping projects, particularly related to historical eras, is that they demonstrate knowledge that may seem to already exist. The act of confirming extant research has a valuable methodological purpose: as we continue to work with and develop digital methods for scholarship in the field of the humanities, overlap between traditional and digital techniques confirms the validity of both approaches and functions as a test case for digital methods as they continue to advance in both availability and also complexity. At the same time, regarding the subject specificity of the Icelandic outlaw sagas, our current understanding is deeply informed by interdisciplinary inquiry. Literary scholarship, anthropological research, archaeology digs, environmental studies, and historical work all inform our knowledge of both the narrative world of the sagas and the physical geography that undergirds it. While scholars may collate these fields of study in another form of narrative—such as the journal article—extrapolating interdisciplinary knowledge not from multiple research projects but from the data held *within the texts themselves* constitutes an important critical act that does not just confirm what we know through other sources, but traces the intrinsicness of this knowledge to the literary works themselves.

Since narrative is a key feature of the literary form of the sagas, we cannot discuss the spatial without the temporal. Narrative theory and narratology often consider the spatiotemporal features of literary texts, from the space in which the narrative occurs, to the space that serves as context, and the axis of time across which this spatiality is constructed semantically (Brasher 2017). Geography in literary narrative is a prime example of this complex spatiality, in which place names do not always constitute geo-reference but exist in a particular web of spatial and temporal associations for the reader. In particular for the *Íslendingasögur*, Barraclough (2012) suggests that the

sagas shaped the “cognitive mapping” of medieval Iceland’s geographic knowledge (2), using narrative as a tool for creating what we might now consider geospatial awareness. To fully understand this narrative aspect, we must consider Old Icelandic conceptions of spatiotemporality—a topic that often has a strong cosmological component. The anthropologist Kirsten Hastrup (1985) reads geographic features of Iceland—in particular, the coastline as a physical and conceptual border—as the basis for cosmological conceptions of space during the medieval period. In doing so, she suggests that the relationship between land and sea, mediated by coastline, gestured to an “intrinsic logic of the use of particular categories of space” in Old Icelandic culture, where coastal spaces become central to society and interior regions become liminal (57; Barraclough 2010, 366). This thesis is underscored by Barraclough’s (2010) observations of outlawry as a geographic construct, and echoed by the patterns of the geocoded locations in this project’s maps.

However, this is not to say that the digital maps *reproduce* a cultural conception of Old Icelandic spatiality; as Margaret Clunies Ross (2011) has argued, the history of graphically depicting Old Norse cosmological features was largely influenced by classical models and nineteenth-century diagrams attributed to Finnur Magnússon (55), and does not reflect the complexity of “an originally oral mythological corpus” (53). Understanding the *Íslendingasögur* in the twenty-first century requires accounting for the multiple transpositions of meaning across media for these texts—from oral form, to written manuscript, to scholarly edition, to digital map. Rather than addressing *what* digital maps make evident, we may better serve our understandings of the medieval North Atlantic by exploring *how* they resonate alongside a longstanding debate over visualization of textual materials stemming from Old Norse sources.

In synergy with Clunies Ross’ (2011) assertion that consolidated visualizations of Old Norse cosmological structures often occur at the expense of complexity, even contemporary critiques of digital mapping note how the geospatial grid ultimately privileges the visibility of larger structures rather than ground-level experiences. Two-dimensional cartographic depiction inevitably reduces the granularity of spatial data and the experiences available within it, which may cause us to neglect certain

interpretive possibilities (Shilling 2014, 226). While certain places in this map have been coded for their categorization as a type of geographic feature, it is difficult to interpret in this mode of representation how the proximity of a glacier, for instance, might change the way a place is experienced or perceived. As we negotiate the tradeoffs of engaging digital geospatial work with more traditional methods, we must continue to engage methods that may seem incomplete or self-evident so as not to forfeit the opportunity to understand our methods with greater clarity. By reading across maps and literary texts, and ensuring our interpretive acts balance both of these modes of storytelling, we may more closely appreciate *how* spatial elements create meaning (Eide 2016, 318).

In this sense, this place name dataset and its resulting digital geospatial map present an opportunity to solidify numerous interdisciplinary theses on medieval Iceland by clicking, scrolling, and zooming to more efficiently interact with the geospatial context of places that the outlaw sagas depict. At the same time, after Detlev Mares and Wolfgang Moschek's (2013) discussion of GIS as a form of data visualization, this project also suggests that mapping constitutes an act of spatial storytelling (64). However, the geospatial maps raise, but do not answer, questions about a place name's relationship to spatiotemporal dimensions of narrative—and perhaps even the role of cosmology in understanding space itself. In handling this narrative aspect, treating place names not as geospatial data, but as networked data within their literary contexts, may make more vivid the ways in which place names create meaning in the Icelandic outlaw sagas. To that end, this project also created data visualizations of place names according to their narrative functions, a process described below.

Literary Space: Visualizing Data Networks

From the work of Barraclough, Byock, and Hastrup, as well as the geospatial rendition of place names in the outlaw sagas, we have established that place names in this body of literature have multivalent meaning. If we return to the project's original XML document encoded with TEI, this flexible format affords a quick opportunity to interrogate place names on the question of not geospatial, but narrative scale, using geospatial visualization. Digital humanities scholars who practice distant reading

methods often create or consider data visualization to demonstrate spatiotemporal elements within literary texts. As such, the term 'mapping' inherently contains an invitation to think spatially and broadly across datasets also, even when geospatial information is not at play, and suggests that we might "treat writing as a field of relations to be modeled, using equations that connect linguistic variables to social ones" (Underwood 2016, 3). While distant reading can be performed at great scale—and indeed, this is its advantage—digital humanities scholarship has also considered visualization as a method for analyzing smaller corpora.

Moretti's *Graphs, Maps, and Trees* (2005), which tackles the question of literary history by using visualizations to vivify patterns across and within texts, depicts maps that focus not necessarily on geospatial coordinates but instead on the spatial dimensions of social networks—as in Mary Mitford's *Our Village* (1824–1832), where he describes not a linear narrative space of time unfolding chronologically, but a circular one that reflects the spatial conception of the village at that time period (38). Moretti (2005) argues that "in order to see this pattern, we must first extract it from the narrative flow" and that mapping is the only way to account for this spatial dimension (39). Particularly in light of the interconnectedness of narrative and network structure, new modes of data visualization can be harnessed to render spatial maps of the stylistic and narrative uses of place name, just as geospatial maps sketch place names' geographic contours (Sack 2014, 87).

This project visualizes place names not necessarily in conversation with large-scale distant reading or data visualization practices, but as with its geospatial maps, in synergy with more local, attentive, and smaller-scale reading practices. One need not look to the digital humanities to find reasons to visualize elements of narrative; after all, as Clunies Ross (2011) explores at length with Magnússon's diagrams of Old Norse cosmology, the impulse to spatially depict premodern narrative and knowledge can be dated back centuries. However, a methodological caveat: Moretti (2005) is quick to note the explanatory limits of mapping: it is "not, of course, that the map is already an explanation; but at least it shows us that there is something *that needs to be explained*" (39). And, it might be said that the map of literary elements is never just *the map*—it always exists in a complex relationship with the text it purports to represent,

the connotations of the extracted data that defy tabular or networked representation, and even the spatiotemporal world of the narrative or of the text historically. Projects like Neatline, which allow users to represent archival materials, images, illustrations, and other materials alongside geospatial maps, constitute an important attempt to negotiate the limits and possibilities of mapping (<http://neatline.org/demos/>), but do not purport to present a comprehensive solution to the critical, methodological, and conceptual questions raised by translating literary texts into data visualizations or maps. To clarify how we might negotiate this process of spatially visualizing place names within a narrative, alongside their geospatial depictions, we must continue to explore methodologies for displaying the narrative qualities of place name, and how visual exploration can benefit our understanding of the stylistic ways in which place names create both literary and spatial meaning.

The same methodological principle that guided data encoding and extraction for the geospatial map informed the task of rendering the non-geographic functions of saga place names visible. Using the same XML file that was originally encoded and exported for place names, I used TEI not just to mark the place names but to add greater granularity to their metadata, focusing on specific qualities associated with place names. The interpretive work of tagging, and in particular the lack of automation in this process, was foundational to the viability of this technique. In this respect, Drucker's (2017) distinction between computational processing and reading provides critical background: processing is "literal, automatic, and repetitive," while "reading is ideational, hermeneutic, generative, and productive" (630). She further argues that "intuitive decisions that are part of human reading are difficult to specify algorithmically," and the encoding procedure for this project sidesteps this algorithmic procedure in favor of a more attentive reading—not only of place names, but also the general categories of their narrative context and function (629). In what follows, I will sketch my reasoning for the interpretive paradigms used by this project and define how these multiple categorizations of place name yield further information on their literary function.

During the process of encoding the outlaw sagas for instances of place name, each place name was encoded by hand after close-reading to analyze and note whether it appeared in prose, poetry, or speech. Place names also received

a designation according to four frequent and overarching stylistic uses, each subjective category that was developed after an initial reading of the corpus. These categories including “declarative,” “affiliative,” “assembly,” and “possessive,” which respectively categorize place names that indicate geographic place for travel or setting, farmsteads or places associated with saga characters, social or legal meetings’ geographic location, and places indicated by their owner’s name. According to these categories, a place name might be coded for multiple categories, such as “declarative prose” or “possessive poetry.” The number of place names in each saga was calculated against the number of total words (as tokens) in each saga so each formal or stylistic categorization could be contextualized within its respective saga or across the sagas as a whole. While these designations do to some extent reduce the granularity of narrative information, the value of explaining the narrative function of these categories of place name affords a workable starting point for stylistic analysis of their narrative possibilities.

According to the aforementioned categories, an overwhelming use of place names occurs in prose and a declarative sense (see **Figure 3**). On average, between the outlaw sagas, 95% of place names occur in prose (1361 of 1443 total place names across the three sagas), and 66% of total place names directly indicate geographic location in the declarative mode (932 place names total). These statistics may be attributed to the paratactic style of the sagas, which at once concentrates narrative action and literary meaning (Springer 1939, 121). Considering parataxis’ utility in conveying precise and in-depth information, this data may suggest that the prose of the saga is economically engineered for plot advancement. For instance, *The Saga of Hord and the People of Holm* indicates the arrival of Brynjolf Thorbjarnarson in “a ship [that] came into Eyrar,” incorporating a declarative use of place name to indicate travel, geographic setting, and a new character (Kellogg 1997, 205). This succinct narrative strategy ultimately generates literary complexity according to Barraclough’s (2010) theory that geographic representation “shape[s] the plot” as well as “the complexity of the narrative layers” in the sagas (365). As she has argued, and as my own readings suggest, declarative use of place name produces the geographic contours of plot and action through travel and settings, and at these sites introduces new characters, geographies, and ultimately narrative tensions into the sagas.

To further pursue the connection between character and place, the affiliative category describes a person’s affiliation or heritage with the location as his or her identifying quality. On average, place names are used to demonstrate affiliation in 20% (297 instances) of total place name uses across the sagas. For greater granularity: *Grettir’s Saga* features 20.7% (177 instances), *Gisli’s Saga* 19.8% (45), and *The Saga of Hord and the People of Holm* 20.1% (75). These percentages corroborate that place names are geographic and also social; they shape the identity of characters and serve as essential reference and even reputation. The sentence in *Gisli’s Saga* which states “There was a man named Thorkel, known as Skerauki, who lived in Surnadal and held the title of *hersir* [local chief or lord],” uses place name to explain more about Thorkel’s identity within the community, incorporating his geographic whereabouts with his profession and names (Regal 1997, 1). The tradition of using place names as affiliative markers goes back to the *Landnámabók*, where Hastrup argues that “people were defined by their dwelling-place and their place of origin,” which constructs identity geographically and also spatially (1985, 59).

The possessive category offers the mirror image of affiliation: instead of describing a place using its name, the place is instead referenced according to the person who lives there. Given the theory that the sagas are “plausible” narratives

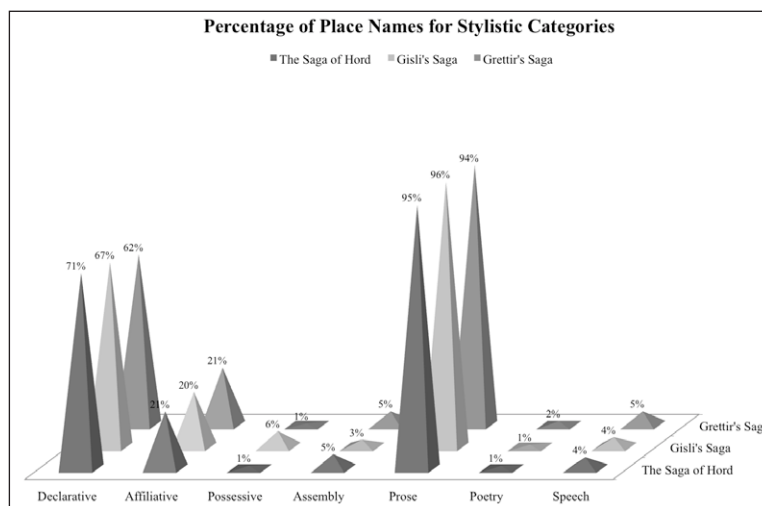


Figure 3: This chart demonstrates the percentage of stylistic types of place name usage in each of the three sagas, and was produced using the encoded data.

“about often real people” in Iceland after the settlement period, the attribution of names to farmsteads melds historical and geographic knowledge (Byock 1984, 153). For instance, in *Gisli's Saga's* description of the settlement period, the author notes that Vestein “lodged at Bjartmar's farm,” indicating a geographic place by way of its owner (Regal 1997, 5). While this is technically a possessive proper name, it nevertheless functions like a place name and furthers the connections between character, social identity, and geographic place names. This category appears only twenty-two times over the course of the three sagas, suggesting that using the actual place name to demonstrate affiliation was far more common. From this data, we might conclude that the place names themselves are essential rhetorical devices, with narrative clout beyond their associations with characters—a reason to use the place name itself, and not just its owner.

To make transparent the social and communal connotations within place name's narrative function, the category of assembly harnesses geographic space, travel, and social relations. Assembly refers to a meeting that occurs in a specific and routine geographic location, and thus functions like a place name. In *Gisli's Saga*, the saga author describes how “Thorkel the Wealthy travelled to the Thorsnes Assembly” at Thorsnes, and in *Grettir's Saga* how “Thorgils Arason rode to the Althing,” in which Althing indicates the annual legal assembly at Thingvellir (Regal 1997, 5; Scudder 1997, 127). Furthermore, the assembly category is often associated with travel as characters traverse Iceland to participate in discussions with local and distant communities, grounding the geographic qualities of the narrative with political participation. Just as with the categories of declarative, affiliative, and possessive, the use of place name to demonstrate assembly suggests that place is at once social, geographic, and spatial within these narratives.

Place names are vividly geographic, as seen in this project's initial map; an assessment of their narrative aspects also suggests that they have a strong social function as a result of producing plot and character associations. Considering overarching stylistic categories, place names work spatially within the narrative, particularly in the declarative and affiliative sense by creating setting, travel and movement, and stationing characters across the medieval North Atlantic landscape.

While this information could be subsumed into metadata on a map, the increasing availability of data visualization software permits visualization of specific categories, independently of a geospatial grid. In order to engage this possibility, this project used the open-source software Gephi, which applies forcedriven algorithms to data in order to display them in a two-dimensional plot that visualizes “underlying structures of associations” across a dataset (Gephi 2013). Once place name data is entered into the Gephi interface, including saga name, number of mentions in each saga, and whether it appeared in prose, poems, speech, or in the predetermined categories of declarative, affiliative, assembly, or possessive usages, the software allows users to apply a variety of algorithms to depict data spatially. The data categories resulted in a network of data made of nodes, or points of the visualization, and the edges or lines that connect them (see **Figure 4**). This visualization can also be explored dynamically using the Javascript library Sigma, (Jacomy and Plique 2014) which was used to mount interactive visualizations created in Gephi within a web browser (<http://www.columbia.edu/~mck2158/network/>).

Algorithms have a reputation, and rightly so, as “black box” formulas that invisibly transform data in ways that can obfuscate or fail to account for final results, thus compromising analysis. However, we might consider Gephi’s visualizations as primarily aesthetic, since the algorithms are used to depict correlations aesthetically, rather than to manipulate the numerical qualities of the data. The visualizations are thus not necessarily to a statistical scale, but rather derived from a degree of calculated edge weight, and are suggestive of affinities between data points based on the categories provided. More specifically, the Gephi force-directed layout algorithm that renders data for this visualization, the Fruchterman Reingold, operates on the concept of edge weight, in which “edge” refers to the lines that connect the nodes, and “weight” refers to a value associated with the edge for this network of the number of categories in which they fit, such as whether they appear in multiple sagas or are featured across stylistic categories. The heavier the weight (that is, the higher it is numerically), the stronger the point’s centripetal force towards the center of the network, particularly towards its other related nodes. The most referenced place names across the three sagas, including Althing (Thingvellir), Reykjanes, and Botn,

among others, appear in the center, as do place names that occur in multiple stylistic categories or in more than one category of prose, poem, or speech.

For instance, Thorsnes appears in all three of the sagas, as well as in prose, a poem, as a designator for an assembly, and in the declarative sense, and it thus has a more central location in the network. Place names that appear less frequently across stylistic categories and sagas occur on the periphery of the network and include locations such as Gnup, which demonstrates affiliation once in prose in *The Saga of Hord and the People of Holm*, and Kattarhofdi, which *Grettir's Saga* uses once in declarative prose. In some sense, our reading strategy for the network parallels our approach to understanding the geospatial map—examining the edges of places, such as coastlines or peripheral points, allows us to hone in on more detailed understandings of place names. At the same time, this visualization may be read inversely to the geospatial maps: the coastlines of Iceland were essential to survival, and the center served as an outlaw's hideaway. For the data visualization, the middle of the visualization, by virtue of the edge weight that draws the most frequently used place names towards the center, the opposite is true. How then, might we

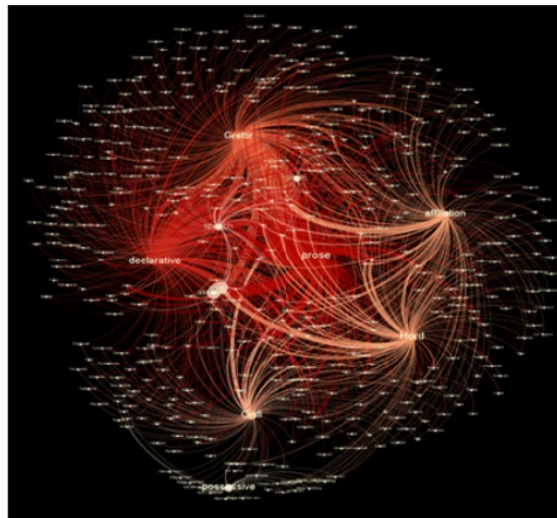


Figure 4: This image is a static screenshot of the Gephi visualization. An interactive version, produced with the Javascript library Sigma, is available at <http://www.columbia.edu/~mck2158/network/>.

reconcile these visualizations—which snap like magnets towards each other at certain moments, and away at others?

In his work on distant reading, Underwood (2016) argues that humanities scholars should borrow from effective and established social sciences techniques in network visualization and text analysis in order to develop methodologies on distant reading (2, 3). Likewise, Moretti's (2005) hunch that the social sciences, rather than French and German metaphysics, were best suited to inspire the next generation of literary theorists suggests that examining literary network analysis alongside its social science counterpoints provides the best methodological approach (2). In order to contextualize this network visualization and suggest ways to interpret the data, a recent advanced social network mapping project on the Icelandic sagas sheds further light on the role of network analysis and literary subjects. Pádraig Mac Carron and Ralph Kenna (2013) use applied mathematics to demonstrate that "on the basis of network theory [the sagas] are remarkably realistic," and the resulting networked display contains a similar balance of central and peripheral nodes as this project's exploration of place name, although this project has used a different algorithm to depict its data (17). As Mac Carron and Kenna (2013) state in their research, "the most fundamental quality in a network is the degree, which is the number of links associated with a given node," and this property determines whether networks are associative—meaning that nodes of similar degrees are often connected—or dissociative, which entails the opposite (13). For Kenna and Mac Carron's study, the associativity of the Icelandic sagas' social networks demonstrates the similarity of visualizations of the saga relationships to social networks that represent contemporary populations. This adds statistical clout to Byock's (1984) scholarship, corroborating digital with traditional methods.

Building on the work of Bruno Latour and actor-network theory (ANT), Mark Erickson (2012) notes that the metaphorical qualities of networks in social science analysis replace "uncertainty with precision, a precision that is fictive" (918), in light of his argument that "network has ceased to be a metaphor," or an object created in language, "and has become an object we can identify in the world" (915). Drucker's omnipresent cautions against interpreting visualizations as self-evident are also applicable here, given the layers of interpretation that crystallize in a single

network visualization and given visualization's capacity to make a series of dense, interconnected, complex social entanglements appear as a self-evident object. However, despite the difficulties in network analysis, from the comparison between the network maps of the saga place names and of saga characters, it does appear that network theory may offer provisional means of examining place names' non-geographic capacities.

Data depicting place names in the outlaw sagas, then, not only describe a character through affiliation, but even in some cases function like a social network, creating a rich array of spatial and social dimensions. Given the similarities between character and place name, such as proper name and use to compel narrative, it is tempting to read place names wholly like characters; however, they also cannot be reduced to purely social dimensions. The narrative functions of place names across the outlaw sagas suggests that literary usages of place names do not just link geographic and imaginative space, but create their own webs of textual meaning in relation to their historical and literary valence. Digital geospatial and data visualization techniques help us visualize this textual phenomenon, and allow us new spatial dimensions in which to slowly, carefully—but also creatively—interpret it.

Conclusion

This project technically stems from a singular dataset—a hand-encoded TEI document that contains the full text of the sagas and markup categories. Using the capacities of XML, I was able to wring multiple meanings from the original document by creating a dataset of geospatial metadata, a dataset for network visualization, and even general statistical analysis of word frequencies. My justification for visualizing these categories of data separately, rather than as a composite piece or as aspects of metadata within a singular visualization, stems from a paradoxical desire for clarity and complexity. While it would have certainly been possible to incorporate the stylistic categories into the metadata for the geospatial map, this would have rendered them otherwise invisible, and relegated them to a subset of geospatial data—thus privileging the geospatial as primary category. And even though Gephi allows geospatial coordinates in its algorithms, this too produces a layer of visual complexity atop an already dense network. This project suggests that place names in the outlaw sagas may give rise to two of many possible interpretive impulses, geographic and narrative,

which do not necessarily require simultaneous visualization to inform each other. By keeping these visualizations separate, we allow meaning to proliferate and build irreducibility in our interpretations of the data. As Katherine Bode and Tara Murphy (2014) state, “data-rich research requires not comprehensiveness or completeness, but a clear understanding of data characteristics and parameters” (176). My intention in refusing completeness by uniting both visualizations in this version of the project stems from the desire to accurately depict the two essential characteristics of the data—geospatial and stylistic—without privileging one over another. After all, the manifold connotations of place names in the sagas cannot be contained into one dimension of experience or representation, whether it be geographic, historical, social, statistical, or networked, and any resulting visualization need not suggest otherwise. Likewise, while these visualizations only speak particularly to the data for the Icelandic outlaw sagas, further research may expand on the insights gained from this project in order to determine whether this method or approach may be more widely applicable across the sagas on the whole, or even other texts.

This article demonstrates that, when encoded and extracted in digital form, the place names featured in *Grettir's Saga*, *Gisli's Saga*, and *The Saga of Hord and the People of Holm* achieve new legibility as depictions of their geospatial and stylistic qualities. This process allows us to visualize places and spaces not just in our mind's eye, but also on an interactive screen that can reveal further patterns and dimensions beyond those that we might extrapolate in discursive literary analysis. This work builds on and complements traditional and indispensable approaches to the *Íslendingasögur*, including Barraclough's narrative work and Hastrup's anthropological theories that have been so influential in interpreting this project's data. By gesturing towards the wealth of research on medieval Iceland's environment as well as Kenna and Mac Carron's network theory approach to saga characters, this project reinforces the necessity of addressing the potential tangible and historical world of the sagas from an interdisciplinary perspective. Indeed, this interdisciplinarity in Old Norse-Icelandic studies has been on the rise in dissertation-level work in the field since 1995 (Poyer and Wolf 2017, 2) and may well be poised to continue in light of collaborative and digital possibilities.

It is true that the body of scholarly literature on the *Íslendingasögur* already confirms the varied qualities of place names in the texts. Yet the application of digital techniques to confirm this and to provide a new way to visualize this information is perhaps more valuable in our current moment of digital scholarship than a digital application that produced entirely new and divergent knowledge. In our desire to engage digital methods and the aspirations they bring for new discoveries, it is essential that we not disregard the projects and results that are neither slick nor showy, but rather small-scale, and that confirm what we know through different means. By modulating our attention between large-scale distant reading and small-scale surface reading practices, we may more fully evaluate the effect of digital methods on the practices that have sustained medieval scholarly inquiry for centuries, and better conceive of ways to integrate digital and more traditional methods.

Many digital humanities scholars speak to the importance of integrating failed methodologies alongside successful ones, particularly given our experimental era of digital research. This project may raise more questions than it answers in terms of its decisions to work in translation or utilize a hand-encoding approach to annotate for narrative uses of place name. However, these caveats were all balanced carefully against the feasibility of the very method of the project itself: extracting place names from a textual body, converting this into data, manipulating this data through mapping and visualization, and ultimately re-contextualizing it in long-form, narrative structure. I hope that this work's findings will be used to develop more streamlined methods of creating digital maps, and to think through the conceptual issues of historical and literary mapping in new ways. In the spirit of Lisa Marie Rhody's (2016) work on feminist data visualization, the productive uncomfortableness of examining each interpretive layer of process—in platform, critical perspective, and method—serves not only as a methodology but as a pedagogical device, animating the possibilities of this type of work for teaching, and advocating for the worth of small-scale digital projects as carefully considered hermeneutic work.

Hastrup argues that “measuring the world in Iceland was a matter of collating [...] spatial and social realities,” an act that can only truly occur within lived historical experience (1985, 62, 69). Even with digital technologies, the contours of historical

space and experience are ultimately unreplicable—yet this does not negate our desire to reach across time and space with narrative, a powerful technology indeed. This project is a provocation, to consider the ways in which digital representation of place name offers access to the milieu of geographic, literary, and social perspectives of medieval Iceland. My hope is that the results of this research will continue to reinforce the multifaceted worldview of the sagas, with possibilities that will far exceed the methodologies and findings here.

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